

Application No. 10/761,088
Amendment dated May 7, 2008
Reply to Office Action of March 20, 2008

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A network management station, comprising:
 - a processor;
 - a memory coupled to the processor; and
 - program instructions provided to the memory and executable by the processor to:
 - transmit a network management message to a device connected to the network management station over a network;
 - collect response information from the device based on the network management message;
 - receive unsolicited information from the device; and
 - analyze the response information and the unsolicited information, which include information regarding device memory utilization, buffer utilization, local area network (LAN) utilization, and cyclical redundancy checking (CRC), according to a set of heuristics to provide a health measurement of the device.
2. (Currently Amended) The network management station of claim 1, further including program instructions that execute to compare device processor utilization, device memory utilization, ~~local area network (LAN)~~ LAN utilization, errors, and trap information with one or more thresholds as parameters to the set of heuristics.
3. (Currently Amended) The network management station of claim 1, wherein the set of heuristics include as parameters; processor utilization, ~~memory utilization,~~

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~~LAN utilization~~, statistics including discards, ~~cyclical redundancy checking (CRC)~~ and frame check sequence (FCS) errors and number of broadcast, and traps, received as both solicited and unsolicited messages from the device.

4. (Currently Amended) The network management station of claim 1, further including program instructions that execute to analyze unsolicited messages initiated from the device to a management program, the unsolicited messages selected from the group of:

- messages reporting successful events;
- messages reporting a traffic threshold; and
- messages reporting a non-functioning component on the device.

5. (Currently Amended) The network management station of claim 1, further including program instructions that execute to collectively analyze all of the collected and received information, both solicited and unsolicited, in order to formulate a health measurement for the device and for the network.

6. (Currently Amended) The network management station of claim 1, further including program instructions that execute to assign pre-selected weight values to the collected and received information, both solicited and unsolicited, as part of an applied heuristic and to use the weight values to provide the health measurement.

7. (Currently Amended) The network management station of claim 6, further including program instructions that execute to initiate network actions, based on the health measurement, to avoid potential issues with the device and the network.

8. (Currently Amended) The network management station of claim 1, further including program instruction that execute to implement different weight values to solicited and unsolicited information as parameters to the set of heuristics as suited to a particular type of network device.

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9. (Currently Amended) The network management station of claim 1, further including program instruction that execute to implement different weight values to solicited and unsolicited information as parameters to the set of heuristics as suited to a particular type of network.

10. (Currently Amended) The network management station of claim 1, wherein the device and the station are connected over a ~~local area network (LAN)~~ LAN.

11. (Currently Amended) The network management station of claim 1, wherein the device and the station are connected over a wide area network (WAN).

12. (Currently Amended) A network management station, comprising:

a processor;

a memory coupled to the processor; and

program instructions provided to the memory and executable by the processor to:

poll a device, connected to the network management station over a network, with network management messages;

receive ~~processor utilization, memory utilization, link up/down status, trap, buffer utilization, discard and error information~~ local area network (LAN) utilization, and cyclical redundancy checking (CRC) information in response to the polling and as unsolicited information initiated by and transmitted from the device; and

apply heuristics to the received memory utilization, buffer utilization, LAN utilization, and CRC information from the polling and unsolicited transmissions collectively to determine a health of the device.

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13. (Currently Amended) The network management station of claim 12, further including program instructions which execute to display a visual indicator of the health of the device.

14. (Currently Amended) The network management station of claim 13, further including program instructions which execute to display additional detail report information upon a selection of the visual indicator.

15. (Currently Amended) The network management station of claim 12, further including program instructions that execute to register, as a parameter to the applied heuristics, that [[the]] data traffic through a port of the device is being under utilized.

16. (Currently Amended) The network management station of claim 15, further including program instructions that execute to register, as a parameter to the applied heuristics, that the data traffic through a port on another network device is overburdened.

17. (Currently Amended) The network management station of claim 16, further including program instructions that execute to initiate an action based on the determined health of device in order to avoid a problem on the device and the network.

18. (Currently Amended) A method for network and network device monitoring, comprising:

transmitting a network management message to a device;

collecting response information from the device based on the network management message;

receiving unsolicited information from the device; and

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analyzing the response information and the unsolicited information, which include information regarding device memory utilization, buffer utilization, local area network (LAN) utilization, and cyclical redundancy checking (CRC), according to a set of heuristics to provide a health measurement of the device.

19. (Original) The method of claim 18, wherein the method further includes transmitting an SNMP message to the device.

20. (Original) The method of claim 19, wherein the method further includes receiving return information contained in a management information base (MIB) of the device.

21. (Original) The method of claim 18, wherein the method further includes transmitting an ICMP ping to the device.

22. (Original) The method of claim 18, wherein the method further includes receiving information using a telnet protocol.

23. (Original) The method of claim 18, wherein the method further includes receiving traps from the device.

24. (Currently Amended) The method of claim 18, wherein receiving unsolicited information includes unsolicited information relating to:

processor utilization;
~~memory utilization;~~
~~local area network utilization;~~ and
errors.

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25. (Original) The method of claim 18, wherein receiving unsolicited information from the device includes receiving messages initiated from the device to a management program, including messages selected from the group of:

- messages reporting successful events;
- messages reporting a traffic threshold; and
- messages reporting a non-functioning component on the device.

26. (Original) The method of claim 18, wherein the method further includes receiving a message, initiated from the device to a management program, which reports that a packet of data has been successfully sent from a port on the device.

27. (Original) The method of claim 18, wherein the method further includes receiving a message, initiated from the device to a management program, which reports that the device is over burdened with traffic and may crash.

28. (Original) The method of claim 18, wherein the method further includes receiving a message, initiated from the device to a management program, which reports that a port on the device is not functioning.

29. (Currently Amended) The method of claim 18, wherein analyzing according to a set of heuristics includes a heuristic having parameters selected from the group of:

- a processor utilization;
- ~~a memory utilization;~~
- a link up/down status;
- a trap receipt;
- ~~a buffer utilization;~~
- a discard receipt;
- ~~a CRC statistic;~~ and
- a FCS statistic.

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30. (Currently Amended) A method for network and network device monitoring, comprising:

polling a device with network management messages;

receiving ~~processor utilization, memory utilization, link up/down status, trap, buffer utilization, and error information~~ local area network (LAN) utilization, and cyclical redundancy checking (CRC) information in response to the polling and as unsolicited information initiated by and transmitted from the device; and

applying heuristics to the received memory utilization, buffer utilization, LAN utilization, and CRC information from the polling and unsolicited transmissions collectively to determine a health of the device and the network.

31. (Original) The method of claim 30, wherein the method further includes displaying a visual indicator of the determined health.

32. (Original) The method of claim 31, wherein the method further includes accessing additional report information by selecting the visual indicator.

33. (Currently Amended) A computer readable medium having instructions for causing a device to perform a method, comprising:

transmitting a network management message to a device;

collecting response information from the device based on the network management message;

receiving unsolicited information from the device; and

analyzing the response information and the unsolicited information, which include information regarding device memory utilization, buffer utilization, local area network (LAN) utilization, and cyclical redundancy checking (CRC), according to a set of heuristics to provide a health measurement of the device.

34. (Currently Amended) A network management station, comprising:
a processor;

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a memory coupled to the processor;

means for receiving solicited and unsolicited information from a network device, the unsolicited information initiated by and transmitted from the network device, the solicited and unsolicited information including ~~processor utilization~~, memory utilization, ~~link up/down status, trap~~, buffer utilization, and ~~error information~~ local area network (LAN) utilization, and cyclical redundancy checking (CRC); and

means for analyzing the received solicited and unsolicited information collectively to provide a health measurement of the network device.

35. (Currently Amended) The network management station of claim 34, wherein the means for receiving solicited information includes executing instructions to send a simple network management protocol (SNMP) query to the network device.

36. (Currently Amended) The network management station of claim 34, wherein the means for receiving unsolicited information initiated by and transmitted from the network device includes executing program instructions to record the unsolicited information and to apply the unsolicited information as parameters in a heuristic analysis.

37. (Currently Amended) The network management station of claim ~~[[34]]~~ 36, wherein the heuristic analysis includes program instructions that execute to assign pre-selected weight values to the solicited and unsolicited information to provide the health measurement.

38. (Currently Amended) The network management station of claim 37, further including program instructions that execute to initiate network actions based on the health measurement.

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39. (Currently Amended) The network management station of claim 38, further including program instruction that execute selectively modify one or more parameters in the heuristic analysis as suited to a particular type of network work and a particular type of network device.